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BEFORE THE BOARD OF PATENT APPEALS AND INTERFERENCES

Application Number: 09/524,140
Filing Date: March 10, 2000
Appellant(s): CHEN ET AL.

Jonathan M. Harris (Reg. No. 44,144)
For Appellant

EXAMINER'S ANSWER

This is in response to the appeal brief filed June 11, 2004.

(1) Real Party in Interest

A statement identifying the real party in interest is contained in the brief.

(2) Related Appeals and Interferences

A statement identifying the related appeals and interferences which will directly affect or be directly affected by or have a bearing on the decision in the pending appeal is contained in the brief.

(3) Status of Claims

The statement of the status of the claims contained in the brief is correct.

(4) Status of Amendments After Final

The appellant's statement of the status of amendments after final rejection contained in the brief is correct. No amendment after final has been filed.

(5) Summary of Invention

The summary of invention contained in the brief is deficient because it fails to discuss many of the key features of the claimed invention. The summary of the invention is incomplete, as it does not mention the use of multi-dimensional databases or of volume cubes, population cubes, base cubes, confidence cubes, support cubes. Applicant also does not give mention to real time data analysis or mention how this data differs from historical data.

(6) Issues

The appellant's statement of the issues in the brief is correct.

(7) Grouping of Claims

Appellant's brief includes a statement that claims 1, 8, 17 and 26 do not stand or fall together, but does not provide reasons as set forth in 37 CFR 1.192(c)(7) and (c)(8). There are no additional limitations to explain why the claims are patentably distinct.

(8) Claims Appealed

The copy of the appealed claims contained in the Appendix to the brief is correct.

(9) Prior Art of Record

6182070	Megiddo	1-2001
5978788	Castelli	11-1999

(10) Grounds of Rejection

The following ground(s) of rejection are applicable to the appealed claims:

Claims 1 – 29 stand rejected under 35 USC 103(a). This rejection is set fourth in this Office Action:

Claim Rejections - 35 USC § 103

4. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

> (a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negatived by the manner in which the invention was made.

5. Claims 1 - 29 are rejected under 35 U.S.C. 103(a) as being unpatentable over Megiddo et al. (US 6,182,070) in view of Castelli et al (US 5,978,788).

6. As per claims 1 and 26, Megiddo et al. teaches a method of generating association rules as "a method for determining one or more association rules having a predetermined relationship

to a dataset" (column 12, lines 37 – 38) and "the steps of generating a predictive association rule which indicates how much variance in a support value and a confidence value is expected" (column 12, lines 58 – 59).

The method comprising:

a) In a processing system, receiving a volume cube, with dimensions product, customer, merchant, time and area, that represents the purchase volume of customers; This is taught by Megiddo et al., which recites using "Number of Frequent Items", which is a count of each individual product, "Number of Customers", which is a count of each individual customer, the choice of "SuperMarket", "Dept. Store" or "Mail Order" for merchant, and the "Number of Transactions" as purchase volume (column 11, table 1).

b) In a processing system, generating a scoped association cube, a population cube and a base cube based on the association cube, population cube, and the base cube based on the volume cube, wherein the scoped association cubes comprise a plurality of bases from distinct data sources (column 5, lines 6 - 8, "identifying association rules between item sets of transactions is provided in which the computer-based system discovers association rules in a dataset"). Generating a new cube or cubes from an existing cube or cubes is taught by Megiddo et al., which recites "generating one or more synthetic databases from the dataset, each synthetic database containing a plurality of transactions" (column 12, lines 43 – 45).

The association cube, with dimensions product, product2, customer group, merchant, time, area, is taught by Megiddo et al., which recites comparing two product as "if they know that, given a consumer's purchase of a first set of items (a first itemset), the same consumer can be expected, with some degree of probability, to purchase a particular second set of items (a

second set)" (column 1, lines 18 –21), "Number of Customers", which is a count of each individual customer or a group of customers, the choice of "SuperMarket", "Dept. Store" or "Mail Order" for merchant, and the "Number of Transactions" as purchase volume (column 11, table 1).

The population cube, with dimensions product, customer group, merchant, time, area, is taught by Megiddo et al., which recites "Number of Frequent Items" as product, "Number of Customers" as customer group, and merchant as the choice of "SuperMarket", "Dept. Store" or "Mail Order" (column 11, table 1).

The base cube, with dimensions customer group, merchant, time, area, is also taught by Megiddo et al., which recites "Number of Customers" for customer group, and merchant as the choice of "SuperMarket", "Dept. Store" or "Mail Order" (column 11, table 1).

c) In a processing system, deriving a confidence cube and a support cube of an association rule based on the association cube, population cube and the base cube.

The confidence cube, of dimensions product, product2, customer group, merchant, time, area, and the support cube, of dimensions product, product2, time, time2, group and merchant are taught by Megiddo et al., which recites more than one product as "Items per Transaction", customer group as "Number of Customers" and merchant as a choice of "SuperMarket", "Dept. Store" or "Mail Order" (column 11, table 1).

Megiddo et al teaches a system that uses a database to perform data mining with the purpose of extracting statistically based association rules (column 5, lines 38 – 40, "a computer system which may be used for mining databases and in particular may be used for discovering predictive association rules"). Megiddo et al further teaches the use of traditional multi-

dimensional database platforms ("the server computer may include a database system, such as DB2 and Oracle", column 5, line 52) that performs aggregations (column 9, lines 37 – 39, "to find the set of frequent pairs, the association discovery process counts the cross-product of all of the frequent items"). Since the applicant defines a data cube as a multi-dimensional data structure having an aggregated dimension, the Oracle multi-dimensional database with the counting aggregation teaches a device that is the same as the applicant definition of a data cube.

However, the device taught by Megiddo does not specifically teach the database fields of time or area.

Castelli teaches a system which specifically recites the terms "cubes" and "multi-dimensional table" (column 9, lines 51 - 52) in teaching "generating multiple projections and/or representations from the database" (column 3, lines 2 - 3), where "a database can be converted into an initial data cube" (column 3, line 8) and "generating multi-representations of a data cube" (column 3, line 15). Furthermore, Castelli teaches a database that incorporates the fields of time and area as it "contain information on several time and space coordinates" (column 5, lines 9 - 10). Castelli uses these specific differences to reduce the error incurred on applying queries and to deliver data in a progressive fashion so as to "provide approximate results at first and more accurate results later, as needed" (column 3, lines 36 - 37).

It would have been obvious to one of ordinary skill in the art at the time the invention was made to incorporate the two query-based multi-dimensional database systems of the Megiddo et al data analysis and rule generation system with the data management data representational Castelli et al system because combining both systems would allow a combined invention to include the time and area as dimensions in the synthetic or multi-dimensional

database tables and thereby improve the accuracy of the statistics-based association rules generation method and system. Incorporating time and area as fields or dimensions will increase the granularity of the data analysis, provide more possible explanations to seemingly significant but coincidental correlations in the data relationships, and decrease the number of rules that are assumed to be true but that are, under closer scrutiny, in fact false, which is known as Type II error. This would have the advantage of prevent marketing and promotional resources from being wasted on projects that were assumed to be true but are in fact false. In the same manner, incorporating cubes and multi-dimensional database tables would also have been obvious because the multi-dimensional data table cubes allow the rules results derived by the Megiddo et al. device to be delivered in stages, with approximate results arriving quickly and more accurate results arriving later on as needed. This provides the benefit of gaining an optimal level of speed and accuracy at a given level of operation within the data processing system.

7. As per claims 2 and 27, Megiddo et al. teaches a method where generating an association cube, a population cube and a base cube based on the volume cube including the step of generating an association cube that has at least two levels and at least two dimensions. This is taught by Megiddo et al., which recites at least two levels in disclosing the three merchant levels of "SuperMarket", "Dept. Store" and "Mail Order" (column 11, table 1). The two dimensions of the association cube is recited by the three types of merchant and the product recited as number of frequent items.

While Megiddo et al. does teach the concepts specified in the claim language, Megiddo et al does not specifically teach the terms "cubes" or "multi-dimensional database".

8. As per claim 3, Megiddo et al. teaches a method where the step of generating an association cube, a population cube and a base cube based on volume includes the step of generating a scoped association rule; wherein the step of deriving a confidence cube and a support cube of an association rule based on the association cube, population cube, and the base cube includes the step of deriving a confidence cube and a support cube of a scoped association rule based on the association cube, population cube, and the base cube. The scoped association rule is taught by Megiddo et al, which recites "discovering purchasing tendencies of consumer side identifying association rules between itemsets of transactions within a database" (column 14, lines 43 - 44).

9. As per claim 4, Megiddo et al. teaches the method with the step of generating an association cube, a population cube and a base cube based on volume includes the step of generating an association rule with conjoint items cube; wherein the step of deriving a confidence cube and a support cube of an association rule based on the association cube, population cube, and the base cube includes the step of deriving a confidence cube and a support cube of an association rule with conjoint items based on the association cube, population cube, and the base cube. Conjoint items, or the ability to consider how buyers consider a range of options, is taught by Megiddo et al., which recites three separate options for a choice of merchant in either "SuperMarket", "Dept. Store" or "Mail Order" (column 11, table 1).

10. As per claim 5, Megiddo et al. teaches the method where the step of generating an association cube, a population cube and a base cube based on volume includes the step of

generating a functional association rule cube; wherein the step of deriving a confidence cube and a support cube of an association rule based on the association cube, population cube, and the base cube includes the step of deriving a confidence cube and a support cube of a functional association rule based on the association cube, population cube, and the base cube. The functional association of using variables to perform calculations, which is taught by Megiddo et al., which recites "Number of Frequent Itemsets" and "Number of Frequent Items", which when multiplied together, produce the product Number of Hypotheses (column 9, lines 68 - 69).

11. As per claim 6, Megiddo et al. teaches the method wherein steps of receiving, generating and deriving using On Line Analytical Processing programming. Receiving is taught by Megiddo et al., which recites "Among other things, the interface functions as an input mechanism for establishing certain variables, including a minimum confidence and support value and the other redetermined/user-defined input parameters disclosed below" (column 6, lines 48 - 52). Generating is taught by Megiddo et al., which recites on-line transactions being used to generate rules as "one or more association rules mined from a database is provided which generates one or more synthetic databases from the dataset, each synthetic database containing a plurality of transactions, each transaction including one or more items, wherein the occurrences of all items in each synthetic database are independent" (column 4, lines 56 - 61). Derriving is taught by Megiddo et al., which recites "the original data from which the association rules have been derived" (column , lines 3 - 4).

12. As per claim 7, Megiddo et al. teaches the method of claim 1 where step (a) includes the steps of:

Receiving a first volume cube that represents the purchase volume of customers for a first region, receiving a second volume cube that represents the purchase volume of customers for a second region, where step (b) includes the step of generating an association cube, a population cube and a base cube based on the first volume cube and the second volume cube.

This is taught by Megiddo et al., which recites the volume, association, population and base cubes as discussed in the analysis of claim 1.

The Megiddo et al patent does not specifically mention the use of regions as fields in a data cube or table. It is notoriously well known to one skilled in the art of computer software development to incorporate dimensions that encompasses regions in the cube data tables because the sales volume of many products varies according to which region of the country said product is marketed in. Some products sell better in the south, while others sell better in the north or on the west coast.

It would have been obvious to one of ordinary skill in the art at the time the invention was made to include region as a dimension in the synthetic database tables is to improve the accuracy of the statistics-based association rules generation method and system. Incorporating regions as fields or dimensions will increase the granularity of the data analysis, provide more possible explanations to seemingly significant but coincidental correlations in the data relationships, and decrease the number of rules that are assumed to be true but that are, under closer scrutiny, in fact false, which is known as Type II error. Incorporating regions would prevent marketing resources from being wasted in regions a product would not sell well in and allow said resources to be more effectively used elsewhere.

13. As per claim 8, 9, 17, 18 and 28, Megiddo et al. teaches the system and method where each LDOS comprises a local computation engine for mining and summarizing transaction data ("determining the statistical significance of one or more association rules mined from a database is provided from the database, each synthetic database containing a plurality of transactions", column 4, line 55 - 58) and at least one local OLAP server, with the local data warehouse being adapted to receive and store said transaction data, "means for generating one or more synthetic databases from the dataset, each synthetic database containing a plurality of transactions, each transaction containing one or more items" (column 13, line 52 - 55).

wherein the local computation engine generates the local profile cubes that contains at least partial information regarding customer profiling by periodically mining new transactions flowing into said local data warehouse and deriving patterns for local analysis, said local computation engine also being adapted to incrementally update said local profile cubes, "a method for data mining which may include the statistical significance determining process in accordance with the invention. The method starts at step 102 in which a database is processed (mined) to discover any association rules" (column 9, lines 60 – 64).

The scoped association rules comprising a plurality of bases from distinct data sources and based on said local profile cubes (column 5, lines 6 - 8, "identifying association rules between item sets of transactions is provided in which the computer-based system discovers association rules in a dataset").

The Megiddo et al patent does not specifically mention the use of kind as a field in a profile cube. A general reason why it would be obvious to include kind as a field is that it is notoriously well known in the art of computer software development to incorporate dimensions

that encompasses kind into the profile cube data tables because kind, which consists of sales volume generated by sales events, coupons and discounts is used to break out sales data and determine which part of the sales volume is being achieved by targeting customers with premium offers and which part of sales volume is being achieved by customers paying full price.

It would have been obvious to one of ordinary skill in the art at the time the invention was made to include kind as dimensions in the synthetic database tables is to improve the accuracy of the statistics-based association rules generation method and system. Incorporating kind as a field or dimensions will increase the granularity of the data analysis, and allow rules to be generated go beyond merely knowing that, in general, a promotion is effective. Using kind will empower the user to actually identify which specific promotional item or event is the most and least effective at increasing sales volume. This will have the benefit of saving money by avoiding sponsoring ineffective sales events and more appropriately channeling these funds into the most cost effective sales events.

The Megiddo et al patent does not specifically recite the use of time and area as fields in a data cube or table and does not specifically use the terms "cubes" and "multi-dimensional table".

Castelli et al does in fact teach the concept and the terms "cubes" and "multi-dimensional table" (column 9, lines 51 - 52), teaches generating multiple projections and/or representations from the database" (column 3, lines 2 - 3), that "a database can be converted into an initial data cube" (column 3, line 8) and "generating multi-representations of a data cube" (column 3, line 15). Furthermore, Castelli teaches a database device that incorporates the factors of time and area as it "contain information on several time and space coordinates" (column 5, lines 9 -10).

Castelli uses these specific differences to reduce the error incurred on applying queries and to deliver data in a progressive fashion so as to "provide approximate results at first and more accurate results later, as needed" (column 3, lines 36 - 37).

It would have been obvious for one of ordinary skill in the art at the time the invention was made to incorporate cubes and multi-dimensional database into the rules results derived by the Megiddo et al. device because this would allow results to be delivered in stages, with approximate results arriving quickly and more accurate results arriving later on as needed. This provides the benefit of gaining an optimal level of speed and accuracy at a given level of operation within the data processing system.

14. As per claims 10 and 19, Megiddo et al. teaches the system and the claim 18 method where a local data warehouse receives and stores transaction data in a first predetermined interval and wherein said local OLAP engine generates said local profile cubes in a second predetermined interval. This is taught by Megiddo et al., which recites "after executing the steps described below, the identifier kernel outputs protective rules" (column 5, lines 37 - 39). In the Megiddo device, the interval is defined as the time it takes to execute a specific number of steps.

15. As per claims 11 and 20, Megiddo et al. teaches the system and the claim 18 method where GDOS comprises a global data warehouse and at least one global OLAP server,

The global data warehouse for receiving and storing the local profile cubes. This is taught by Megiddo et al., which recites "means for generating one or more synthetic databases from the dataset, each database containing a plurality of transactions" (column 14, lines 23 - 25).

The global computation engine for combining summary information from each of said LDOS to build and incrementally update said global profile cubes and association rules, and for providing feedback to said plurality of LDOS. This is also taught by Megiddo et al., which recites "means for generating one or more synthetic databases from the dataset" (column 14, lines 23 - 24).

16. As per claims 12 and 21, Megiddo et al. teaches the system and method where said local and global profile cubes comprise information of a plurality of customers, said information being derived from transaction data with said customers as stored by said local and global data warehouses, said profiling information specifying at least the following: kind, product, customer, merchant, time and area. This is taught by Megiddo et al., which recites "a computer-based system for discovering purchasing tendencies of consumers by identifying association rules between itemsets of transactions is provided in which the computer-based system discovers association rules in a dataset and generates one or more synthetic databases from the dataset, each synthetic database containing a plurality of transactions wherein the occurrences of all items are independent" (column 5, lines 5 - 20).

17. As per claims 13 and 22, Megiddo et al. teaches the system and method where said local profile cubes are maintained at LDOS and said global profile cubes are maintained at GDOS, each of said local profile cubes being populated by mapping values in transaction data records into each dimension of said profile cube, each of said global profile cubes being retrieved and updated by merging appropriate local profile cubes. This is taught by Megiddo et al., which

recites "all of the combinations of items are found which have a transaction support above the minimum user-defined support and these combinations of items are called frequent itemsets. Next, the frequent itemsets are used to generate desired association rules" (column 2, lines 47 - 52).

18. As per claims 14 and 23, Megiddo et al. teaches the method and the system where said profile cubes are used to derive a plurality of shopping pattern cubes, said shopping pattern cubes comprising;

Shopping behavior of at least one customer. This is taught by Megiddo et al., which recites the ability to break out data by "Number of Customers" (column 11, table 1).

Shopping patterns based on probability distribution; This is taught by Megiddo et al., which recites "means for ranking the identified association rules based on the determined likelihood in order to identify association rules which have a predetermined relationship to the dataset" (column 13, lines 64 - 66) and "The p-value of a test result is the probability of obtaining an outcome as least as extreme as the outcome actually observed assuming that the null hypothesis is true" (column 7, lines 33 - 35).

Shopping patterns based on volume; This is taught by Megiddo et al., which recites determining patterns based on "Number of Transactions" and "Number of Frequent Items" (column 12, table 1).

19. As per claims 15 and 24, Megiddo et al. teaches the system and method where association rules comprise scoped association rules with different bases, each of the bases being

said scoped association rule's population over which said scoped association rules is defined; This is taught by Megiddo et al., which recites " computer usable code means also discovers a plurality of association rules by analyzing the transactions having a similar probability threshold value for each synthetic database" (column 4, lines 25 – 28).

Multidimentional association rules with "customer" being its base, "products" being its item, and "merchant", "area" and "time" being underlying features of said multidimentional association rules; This is taught by Megiddo et al., which recites "Number of Frequent Items", and "SuperMarket", "Dept. Store" and "Mail Order" as merchants (column 11, table 1).

Multilevel association rules with its features being represented at multiple levels. This is taught by Megiddo et al., which recites "the database comprises one or more transactions, wherein each transaction contains one or more items" (column 3, lines 65 - 67).

The Megiddo et al patent does not specifically recite the use of "area" and "time" as fields being underlying features of said multidimentional association rules. A general reason for incorporating area and time would be that it is notoriously well known in the art of computer software development to incorporate dimensions that encompasses time into the cube data tables because sales for many products are seasonal, with sales increasing or decreasing based on season of year, month, or proximity to Christmas or other holidays. Sales of products may also vary with time of month or day of the week. It also is well known to incorporate area or region because the sales volume of many products varies according to which area of the country said product is marketed in. Some products sell better in the south, while others sell better in the north or on the west coast. Similarly, some products sell greater volumes in the city, while others sell more in the country.

It would have been obvious to one of ordinary skill in the art at the time the invention was made to include time and area as dimensions in the synthetic database tables is to improve the accuracy of the statistics-based association rules generation method and system. Incorporating time and area as fields or dimensions will increase the granularity of the data analysis, provide more possible explanations to seemingly significant but coincidental correlations in the data relationships, and decrease the number of rules that are assumed to be true but that are, under closer scrutiny, in fact false, which is known as Type II error. This would have the advantage of prevent marketing and promotional resources from being wasted on projects that were assumed to be true but are in fact false.

20. As per claims 16 and 25, Megiddo et al. teaches the system and method where association rules are mined by:

Converting a volume cube into an association cube, a base cube and a population cube, said volume cube representing purchase volumes of customers dimensioned by item, base and feature; The purchase volumes are taught by Megiddo et al., which recites "Number of Transactions" (column 11, table 1).

Deriving a support cube based on said base cube and said association cube; and

Deriving a confidence cube based on said base cube and said association cube;

This is taught by Megiddo et al., which recites "generating one or more synthetic databases from the dataset, each dataset containing a plurality of transactions, the occurrence of all items in each synthetic database being independent"(column 12, lines 43 - 45).

A support cube, with dimensions customer, product, group, merchant, time, time2 and area, is taught by Megiddo et al., which recites "Number of Customers" for customer, "Number of Frequent Items" for product, "Number of Frequent Itemsets" for group, and "SuperMarket, Department Store and Mail Order" for merchant (column 11, table 1).

21. As per claim 29, Megiddo et al teaches a data mining system that extracts predictive association rules from a database of transactions data. The system uses a server (column 5, lines 47 – 49), is accurate within a minimal level of confidence interval constraints and aggregates data by counting the number of customers, transactions and by calculating average values of items per transaction. Megiddo does not teach cubes that also perform aggregations.

Castelli et al teaches a CUBE based system that runs on a server (figure 1, item 106) and that also performs aggregations of data ("avg, count, sum, min, max", column 1, lines 56 - 61).

It would have been obvious to one of ordinary skill in the art at the time the invention was made to combine the Megiddo et al server based data mining and association rule generating system with the Castelli et al server based, aggregation producing CUBE based data base amalgamation system in order to create a system that presented the data rules in a cube based system because presenting the association rules would improve the accuracy of the statistics-based association rules generation method and system by increasing the granularity of the data analysis, provide more possible explanations to seemingly significant but coincidental correlations in the data relationships. This would serve to decrease the number of rules that are assumed to be true but that are, under closer scrutiny, in fact false, which is known as Type II error. This would have the advantage of prevent marketing and promotional resources from

being wasted on projects that were assumed to be true but are in fact false. In the same manner, incorporating cubes and multi-dimensional database tables would also have been obvious because the multi-dimensional data table cubes allow the rules results derived by the Megiddo et al. device to be delivered in stages, with approximate results arriving quickly and more accurate results arriving later on as needed. This provides the benefit of gaining an optimal level of speed and accuracy at a given level of operation within the data processing system.

(11) Response to Argument

Response to Appellant's assertion: I. As per claim 1, the cited synthetic databases taught by the art do not teach the claim 1 features of generating scoped association cubes (page 4 of Appeal Brief).

Applicant makes this assertion by claiming that the synthetic databases taught by Megiddo do not represent the multi-dimensional data structures of a volume cube, population cube, base cube, or confidence cube. However, the databases or data cubes are defined by the applicant in the applicant's specification as a title followed by a series of attribute field or cell values, such as on page 19, a volume cube titled SaleUnits contains the cells of customer, product, merchant, time, area. The Megiddo and Castelli references teach each recited cell in each data cube claimed by the applicant. Applicant also argues that Mediggo does not constitute data drawn from a plurality of databases. However, Mediggo in figure 1 item 20, clearly refers to databases, where the plural form of the word databases clearly contains more than one database, wherein each of a plurality of databases are distinct. Furthermore, Mediggo teaches

"the method generates one or more synthetic databases", column 3, lines 45 – 46, wherein one or more databases teaches a plurality of databases.

Response to Appellant's assertion: II. As per claim 1, the cited references do not teach scoped association cubes from claim 1 (page 4 of Appeal Brief).

Applicant makes this assertion by claiming that Megiddo teaches rules defined by a similar probability threshold value. However, Mediggo does teach "the method generates one or more synthetic databases from the data set based on random seeds, each synthetic database containing a plurality of transactions wherein the occurrence of all items are independent and discovers a plurality of association rules", (column 3, line 67 – column 4, line 4). Furthermore, the applicant does not define a specific meaning of the term 'scoped' in the claims, the appeal brief or the specification that would specifically define what scoped means, why it is novel or why it is patentable. The examiner interprets the term 'scoped' to mean within the scope of the data or database being examined. As such, if the association rules are contained in a database generated from a base database, then the association rules would be within the scope of the database by virtue of being contained in a derived database.

Furthermore, Castelli teaches the use of the cubes as "the approximated often smaller version of the database called data cubes", (column 3, lines 6 - 7) wherein the cubes are taught as multi-dimensional as "multi-resolution technique having features of present invention for producing multiple representations for approximation of a data cube", (column 5, lines 29 – 31) and of a multi-dimensional database "the relational table may contain 4-dimensional earth temperature data", (column 5, lines 7 - 8).

Thus, both Mediggo and Castelli teach multi-dimensional databases, with Castelli referring to them as cubes.

Response to Appellant's assertion: III. As per claim 8, the cited references do not teach a plurality of local stations and at least one global station coupled to the local stations. (page 4 of Appeal Brief).

Applicant makes this assertion by claiming that Megiddo does not teach a plurality of local computational engines for mining rules that are further gathered and summarized by a global station. However, Megiddo does teach one single local computational engine that performs the creation of databases that contain the derived association rules. Megiddo also teaches many different sizes and levels of data samples as "Supermarket-1.5 million transactions; Dept Store-570,000 transactions; Mail Order-3 million customers", column 11, lines 1 - 12). Castelli teaches use of multiple local servers for generation of rules in the form of queries and the incorporation of "multiple clients and multiple servers are incorporated by a network", (column 4, lines 14 - 16), wherein the results can be sum totaled or aggregated "different levels of accuracy can be obtained when the range-based aggregation is applied at different resolution levels", (column 7, lines 1 - 3).

Aggregation of a plurality of local groups into a global group is a method that is old and very well known in the art of business and is exemplified in such area as aggregating units into a group or plants into a division or companies into a corporation, the idea of such an aggregation of local units into a global unit does not present a concept, method or system that is patentably different and distinct enough to merit a patent. Therefore, since Megiddo teaches the derivation of association rules from a plurality of multi-dimensional databases, and Castelli teaches

derivation of query rules aggregated from a plurality of local clients into a global unit, the two inventions in combination are sufficient to teach the applicant's invention, and since aggregation of locals into global is not novel idea, the invention does not merit a patent.

Response to Appellant's assertion: IV. As per claim 17, the cited references do not teach generating association rules at the global server level by combining or summarizing the data generated at the local levels (page 5 of Appeal Brief).

Applicant makes this assertion by claiming that Megiddo and Castelli do not teach a plurality of local servers and a global server that generates association rules. However, Megiddo does teach the generation of association rules from a plurality of databases and from a plurality of servers "the system may include one or more digital processing apparatus, such as a client computer and a server computer", column 5, lines 42 - 43), wherein one or more servers is a plurality of servers. Further, Castelli teaches generation of rules by use of a plurality of servers "Multiple clients and multiple servers are interconnected by a network", (column 3, lines 13 - 15) wherein the data is aggregated at a global level "range-based aggregation", (column 7, line 2), wherein range is the size of the local group or the number of local groups aggregated into the global level.

Therefore, since Megiddo teaches the derivation of association rules from a plurality of multi-dimensional databases and Castelli teaches derivation of query rules aggregated from a plurality of local servers into a global resolution, the two inventions in combination are sufficient to teach the applicant's invention.

Response to Appellant's assertion: V. As per claim 28, the cited references do not teach a global computation engine that generates scoped association rules (page 5 of Appeal Brief).

Applicant makes this assertion by claiming that Megiddo and Castelli do not teach distributing processing to the local and global computation engines that generate association rules. However, Megiddo does teach the generation of association rules from a plurality of databases using a computation engine. Further, Castelli teaches generation of rules by use of a plurality of servers "Multiple clients and multiple servers are interconnected by a network", (column 3, lines 13 - 15) wherein the data is aggregated at a global level "range-based aggregation", (column 7, line 2), wherein range is the size of the local group or the number of local groups aggregated into the global level.

Therefore, since Megiddo teaches the derivation of association rules from a plurality of multi-dimensional databases and Castelli teaches derivation of query rules aggregated from a plurality of local clients into a global resolution, the two inventions in combination are sufficient to teach the applicant's invention.

For the above reasons, it is believed that the rejections should be sustained.

Respectfully submitted,

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